

Claims

1. Process for the removal of contaminating sulfur compounds, more in particular thiophenic sulfur compounds, from hydrocarbon feedstocks, said process comprising contacting the feedstock in the presence of hydrogen with a sulfided nickel adsorbent, of which adsorbent the rate constant for tetralin  
5 hydrogenation activity at 150°C is less than 0.01 l/s.g cat and wherein in said adsorbent part of the nickel is present in the metallic form
2. Process according to claim 1, wherein at least 10 %, on atomic basis, of the nickel is in the metallic form.
3. Process according to claim 1 or 2, wherein the nickel surface has an  
10 atomic S to Ni ratio of at least 0.5.
4. Process according to claims 1-3, wherein the said nickel adsorbent has been obtained by treating a metallic nickel adsorbent, optionally on a support or containing a structural promoter, with sulfur or a sulfur compound or by coprecipitating the precursors for the nickel adsorbent and the sulfur  
15 compound.
5. Process according to claim 4, wherein the said treatment encompasses precipitating S, a polysulfide or an S-compound on the nickel adsorbent, by coprecipitating S, a polysulfide or an S-compound with the nickel adsorbent precursors, or impregnating the nickel adsorbent with S, a  
20 polysulfide or an S-compound sulfur compound.
6. Process according to claim 5, wherein the said S-compound is selected from the group of di-benzo-thiophene, 2-methyl thiophene, benzothiophene or dimethyl thiophene.
7. Process according to claims 1-6, wherein the hydrogen partial  
25 pressure is between 0.1 and 200 bar and preferably between 10 and 75 bar and more in particular between 30 and 50 bar.

8. Process according to claims 1-7, wherein the hydrocarbon feedstock is selected from benzene and hydrocarbon resins.
9. Process according to claims 1-8, wherein the nickel adsorbent comprises nickel that is present on a support material.
- 5 10. Process according to claim 1-9, wherein the process is carried out in a fixed bed or slurry phase.
11. Process according to any one of the claims 1-10, wherein the nickel adsorbent further contains an oxide of a metal that forms stable sulfides under the conditions applied in the process for the removal of contaminating sulfur compounds from hydrocarbon feedstocks.
- 10 12. Process according to claims 1-10, wherein the said hydrocarbon feedstock is subsequently subjected to a treatment with an oxide of a metal that forms stable sulfides in the process for the removal of contaminating sulfur compounds from hydrocarbon feedstocks.
- 15 13. Process according to claims 1-12, wherein the temperature is between 50 and 300 °C, preferably between 100 and 200 °C.
14. Process for preparing a nickel adsorbent suitable for use in the process of claims 1-13, wherein a passivated nickel adsorbent material containing oxidic nickel, optionally on a support or in the presence of a structural promoter, is reduced with hydrogen at a temperature between 100 and 200°C, followed by treatment of the surface of the reduced material with sulfur or a sulfur compound, preferably in an inert solvent, to yield a nickel adsorbent, of which adsorbent the rate constant for tetralin hydrogenation activity at 150°C is less than 0.01 l/s.g cat and wherein in said adsorbent part of the nickel is present in the metallic form.
- 20 15. Process for preparing a nickel adsorbent suitable for use in the process of claims 1-13, wherein a calcined nickel adsorbent material containing oxidic nickel, optionally on a support or in the presence of a structural promoter, is reduced with hydrogen at a temperature between 100 and 500°C, followed by treatment of the surface of the reduced material with sulfur or a
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sulfur compound, preferably in an inert solvent, to yield a nickel adsorbent, of which adsorbent the rate constant for tetralin hydrogenation activity at 150°C is less than 0.01 l/s.g cat and wherein in said adsorbent part of the nickel is present in the metallic form.

5 16. Process according to claim 14 or 15, wherein the said sulfur compound is selected from the group of di-benzo-thiophene, 2-methyl thiophene, benzothiophene or dimethyl thiophene.

17. Process for preparing a nickel adsorbent suitable for use in the process of claims 1-13, said process comprising preparing a sulfur containing  
10 nickel adsorbent by coprecipitating a precursor for the adsorbent from a solution containing nickel, optionally a dissolved or solid support or structural promotor precursor material, and a sulfur compound, calcining and/or passivating the precipitated material, followed by reduction thereof with hydrogen at a temperature between 100 and 500°C, to yield a nickel adsorbent,  
15 of which adsorbent the rate constant for tetralin hydrogenation activity at 150°C is less than 0.01 l/s.g cat and wherein in said adsorbent part of the nickel is present in the metallic form.

18. Process according to claims 14-17, wherein at least 10 %, on atomic basis, of the nickel is in the metallic form.

20 19. Process according to claims 14-18, wherein the nickel surface of the adsorbent has an atomic S to Ni ratio of at least 0.5.

20. Process according to claims 17-19, wherein the said sulfur compound is selected from water soluble sulfide salts, preferably sodium sulfide.

21. Nickel adsorbent suitable for use in the process of claims 1-13,  
25 comprising a nickel material, of which adsorbent the rate constant for tetralin hydrogenation activity at 150°C is less than 0.01 l/s.g cat and wherein in said adsorbent part of the nickel is present in the metallic form.

22. Nickel adsorbent according to claim 21, of which adsorbent the nickel surface has an atomic S to Ni ratio of at least 0.5.